Notice of Allowability	Application No.	Applicant(s)	
	10/014,742	HEEB, BEAT	
	Examiner	Art Unit	
	Hoang-Vu A. Nguyen-Ba	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment filed December 13, 2004*.

2. ☒ The allowed claim(s) is/are *1-18,20-22 and 24*.

3. ☐ The drawings filed on _____ are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 11/22/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other *App'd Drawings&Fax Sheet*.

Hoang-Vu A. Nguyen-Ba

ANTONY NGUYEN-BA
PRIMARY EXAMINER

Continuation of Attachment(s) 9. Other: Approved Drawings & Fax Cover Sheet.

EXAMINER'S AMENDMENT and
EXAMINER'S STATEMENT OF REASON FOR ALLOWANCE

1. This action is responsive to amendment filed December 13, 2004.

Response to Amendments

2. Per applicant's request, claims 1-19 have been amended; new claims 20-24 have been added. Claims 1-24 are pending.

3. The objection to the drawings made in the previous office action is withdrawn in view of Applicants' amendments to the drawings to correct the identified informalities. Copies of the approved corrected drawings with the Examiner's initial are attached to this Office action. However, corrected drawings **labeled** as "Replacement Sheet(s)" must be submitted.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective

action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

4. The objection to the specification is withdrawn in view of Applicants' amendments to the specification to correct minor informalities.

5. The objection to claims 2, 6 and 9 is withdrawn in view of Applicants' amendments to these claims to correct minor informalities.

6. The rejection of claims 3-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement is withdrawn in view of Applicants' amendments to the specification to clarify the limitations "using information from preceding instructions to mimic an optimizing compiler" and "to mimic an optimizing compiler" recited in the claims.

7. The rejection of claims 2-19 under 35 U.S.C. § 112, second paragraph, as being indefinite is withdrawn in view of Applicants' amendments to these claims to provide proper antecedent basis to the identified terms.

8. The provisional obviousness-type double patenting rejection of claims 1-19 over claims 1-29 of copending Application No. 10/016,794 is withdrawn in view of Applicants' filing of a terminal disclaimer.

9. The rejection of claims 1 and 3-8 under 35 U.S.C. § 102(a) is withdrawn in view of Applicants' amendments to these claims to incorporate the identified allowable subject matter.

Examiner's Amendment

10. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William F Ahmann, Reg. No. 52,548 on May 20, May 26, and June 3, 2005.

The application has been amended as follows:

a. **Claim 3:**

i. in line 11, after "said native machine code", delete the period and insert -- ; and –

ii. in line 12, insert – producing said native machine code in a single sequential pass in which information from preceding instruction translation is used to perform the same optimizing process of an optimizing compiler without the extensive memory and time requirements. –

b. Cancel **Claim 19**

c. **Claim 9:** in line 5, after "setting" delete "said"

d. **Claim 13:** in line 4, after "method duplicating or reordering" delete "said" and insert – a –

e. **Claim 14:** in line 4, after "emitting native machine code using", delete "said"

f. **Claim 15:** in line 4, before "stack mapping information", delete – said --

g. **Claim 21**: replace claim 21 (page 15 of Amendments to the Claims) with the following:

21. (currently amended) A computer implemented method, comprising:

processing a first bytecode of a sequence of bytecodes;

processing a second bytecode of the sequence of bytecodes using information ~~associated with~~ resulting from the processing of the first bytecode; and

producing optimized native machine code in a single pass through the sequence of the bytecodes, using preceding translation information to optimize the native machine code.

h. Cancel **Claim 23**.

Examiner's Statement of Reasons for Allowance

11. Claims 1-18, 20-22 and 24 are allowed.

12. The following is an examiner's statement of reasons for allowance.

The prior art of record, i.e., applicant's admitted prior art (APA), teaches attempts to improve compilation speed by compilation during idle times and by pre-verification. However, APA fails to teach or suggest improving compilation speed using a second code segment that creates optimized machine code from bytecodes received by a first code segment in a **single** sequential **pass** in which **information**

from preceding instruction translation is used to perform the same optimizing process of an optimized compiler without the extensive memory and time requirement, as recited in the amended independent claims 1, 3 and 20.

Furthermore, APA does not teach or suggest the limitations recited in claim 2.

Moreover, a copy of a newly found reference, which is now made of record, i.e., Azevedo-Nicolau-Hummel, Java™ Annotation-Aware Just-in-time (AJIT) Compilation System ("AJIT") was faxed to Applicants on June 1, 2005 for review. On June 2 and 3, 2005, Applicants' representative and the examiner discussed over the telephone the claim language of Claim 21 in light of the teachings of AJIT. Agreement was reached that by amending the claim language to read "using information resulting from the processing of the first bytecode" instead of "using information associated with the processing of the first bytecode," Claim 21 would distinguish over the teachings of AJIT.

AJIT presents an alternative to an optimizing JIT compiler that makes use of code annotations generated by a Java™ front-end (i.e., Java™ compiler, a.k.a., Javac). These annotations carry information concerning compiler optimization. During the translation process, an annotation-aware JIT (AJIT) system then uses this information to produce high-performance native code without performing much of the necessary analyses or transformations. The process of producing native code from an annotated Java™ bytecodes is done in a single pass over the bytecode stream. As each bytecode and its annotations bytes are read, a corresponding Kaffe IR operation is generated. The generated Kaffe IR operation depends on the information provided by the annotations. This information may suggest that the bytecode translation be entirely skipped, or that some sub-operations be eliminated or simplified. AJIT, however, fails to teach or suggest that processing a second bytecode of the sequence of bytecodes using **information resulting from the processing of the first**

bytecode and producing optimized native machine code in a single pass through the sequence of bytecodes, **using preceding translation information** to optimize the native machine code (instant claims 21, 1 and 3). The Kaffe IR operation in AJIT depends on the information provided by the annotations that are **associated with** the bytecode that is **currently** processed as opposed to the information **resulting from** the processing of the **preceding** bytecode (emphasis added) as claimed in the present invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submission should be clearly labeled "Comments on Statement of Reasons for Allowance."

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoang-Vu "Antony" Nguyen-Ba whose telephone number is (571) 272-3701. The Examiner can normally be reached on Tuesday-Friday, 7:15 to 17:15.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tuan Dam can be reached at (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANTONY NGUYEN-BA
PRIMARY EXAMINER

Art Unit 2192

June 8, 2005

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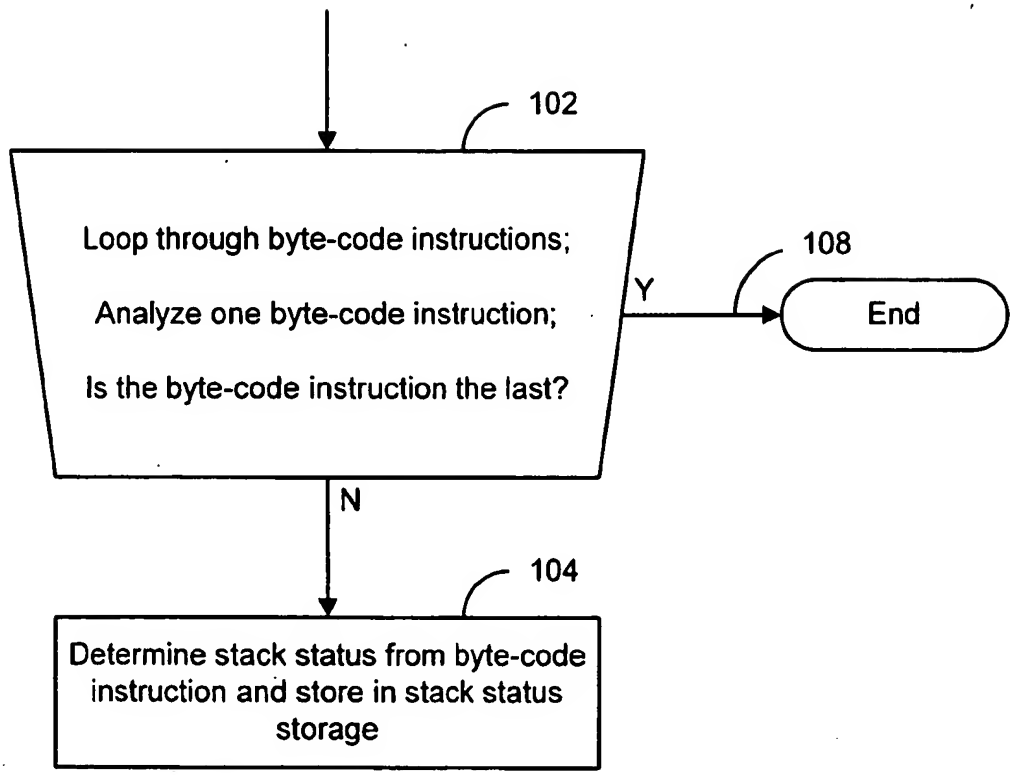

Approved by examiner Han 5/28/05

FIG. 1A
(Prior Art)

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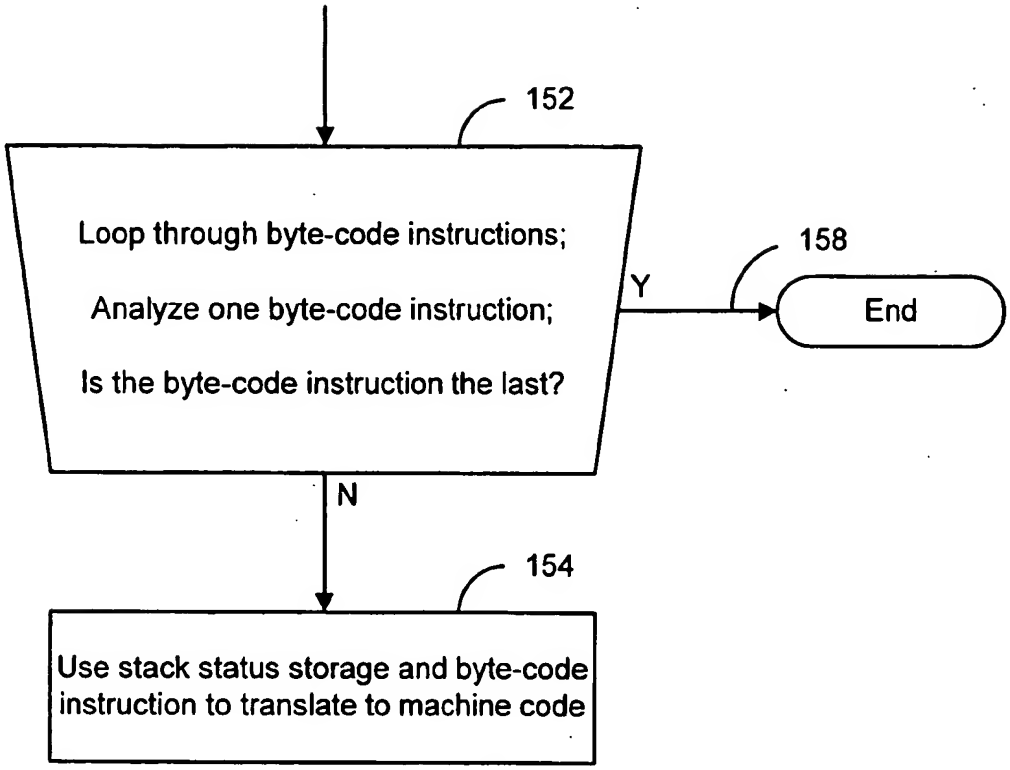

Approved by examiner Glen 5/28/05

FIG. 1B
(Prior Art)

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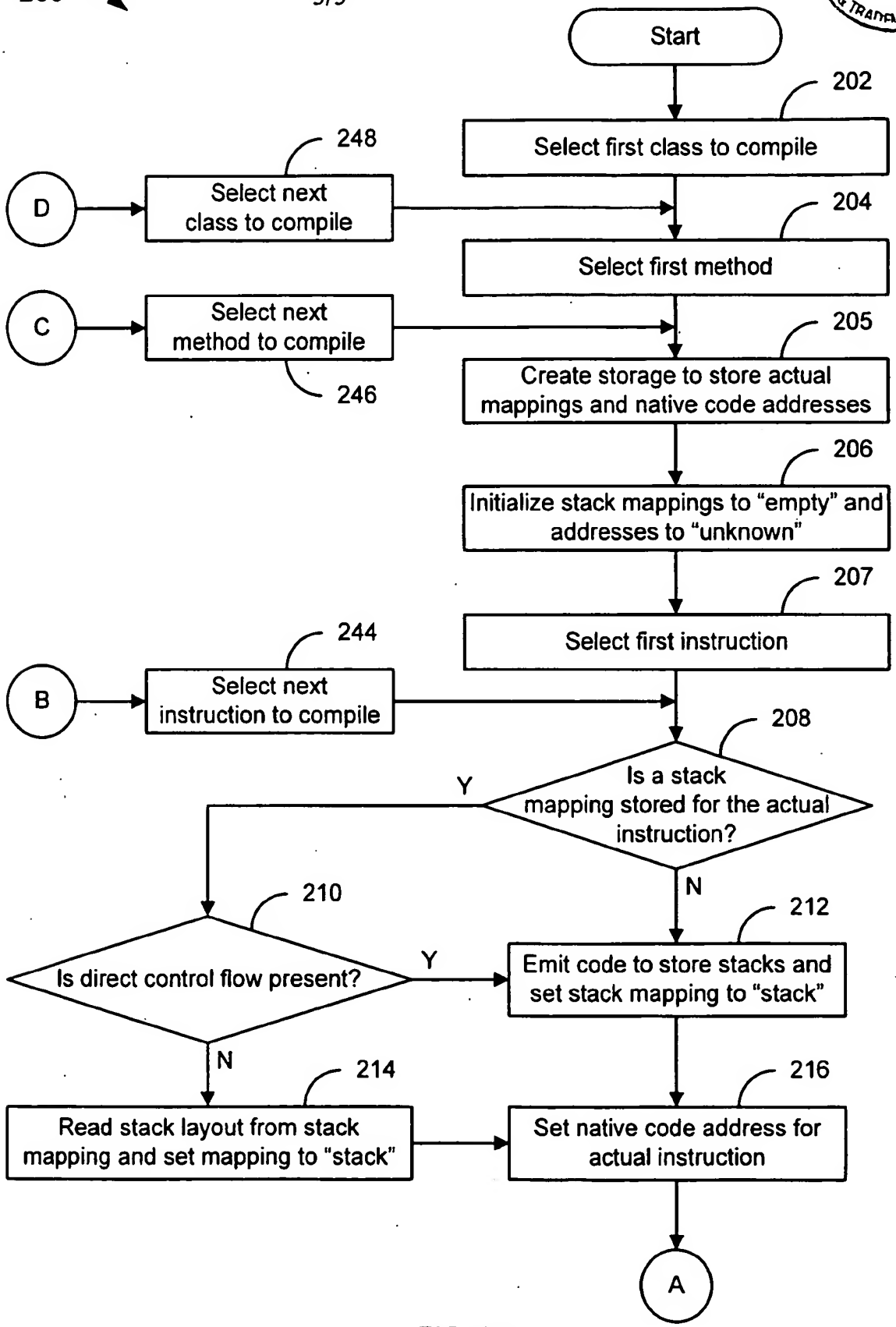

FIG. 2A

Approved by examiner Alan 5/28/05

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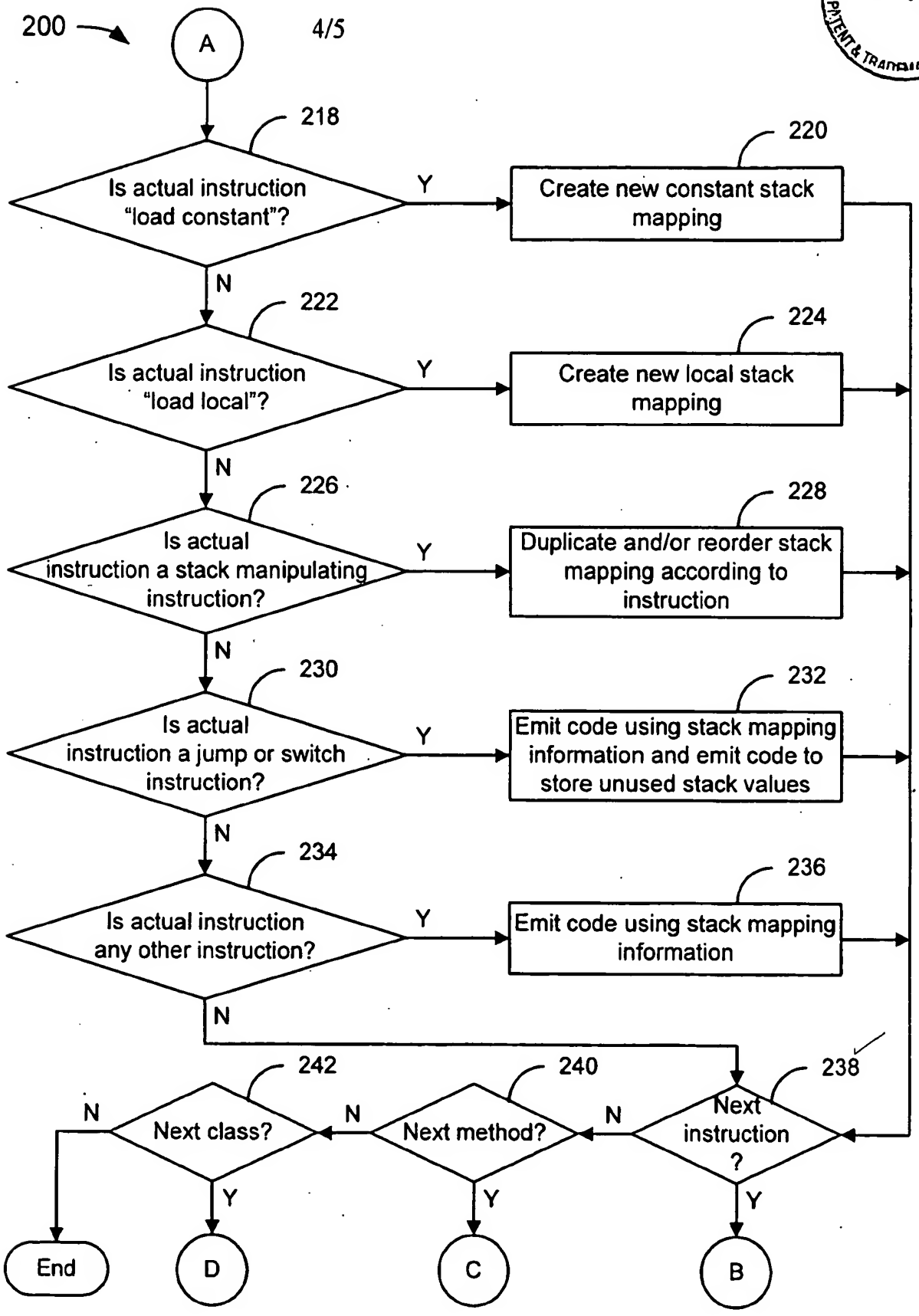

FIG. 2B

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For each value on the bytecode stack	A field showing actual mapping to storage in target machine	Constant
		Local
		Temporary
		Stack
	A field containing additional information	Constant Value
		Slot Number
		Register Number
For each target of a jump or switch instruction	A field to store native code address	

Approved by examiner Han 5/28/05

FIG. 3